OVEN DRYING

One way to save Victory Garden Surplus

U. S. DEPARTMENT OF AGRICULTURE
AWI-59

★ ★ ★

If you have a gas or electric range in the kitchen—
The oven offers a simple and satisfactory way to dry fruits and vegetables for winter meals.

★ ★ ★

Apples to Turnips

Most foods successfully dried in the sun or in a home drier can be dried in an oven.

The drying table in this folder gives directions for 39 fruits and vegetables—from apples to turnips. If there's a star on the list, it's dried sweet corn because of its good flavor and because corn is the hardest vegetable to can successfully at home.

Home drying doesn't suit lettuce, melons, cucumbers, radishes. Asparagus can be dried, but is not so good as most dried vegetables.

Understand at the Start

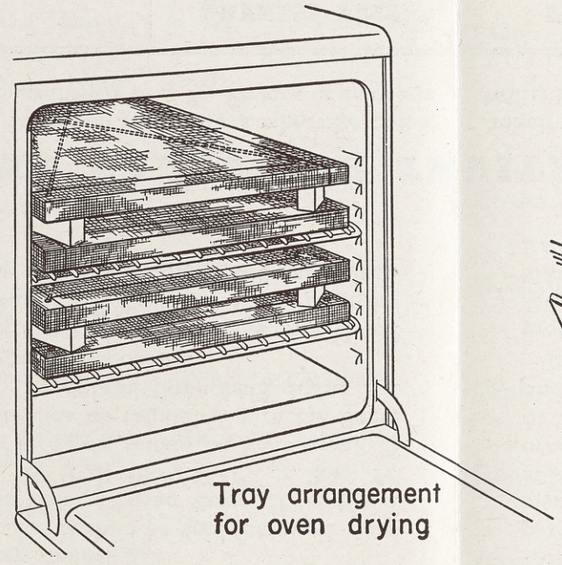
1. Oven drying is small-scale drying. An oven can take 4 to 8 pounds—preferably 6—of a prepared fruit or vegetable at one drying load. It takes most of a day for the load to dry.

2. Oven drying is a watchman's job. Never go off and leave food drying in an oven. Gas pressure may change. If trays should catch fire, turn off the heat and close the oven door.

If You Buy Trays

You can buy trays or make them. Be very sure ready-made trays are right size for your oven. If bought trays have wire surface, cover with cotton netting so food won't stick, and so shredded or tiny pieces won't slip through. Metal trays cannot be used in sulfuring.

EQUIPMENT NEEDED



Tray arrangement for oven drying

Tray Making

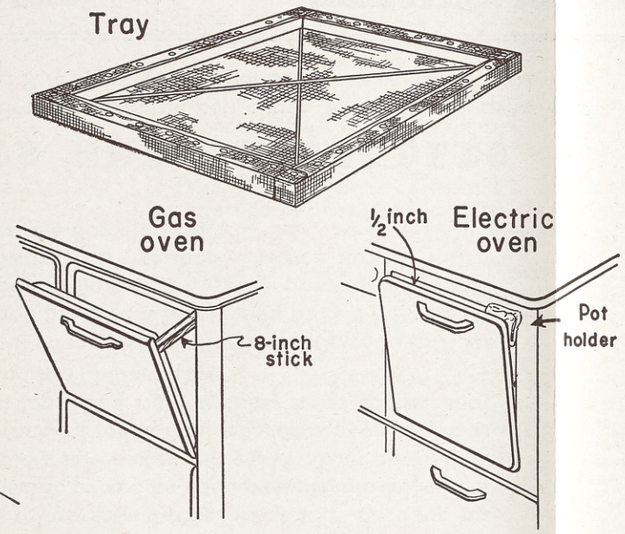
Materials: Soft lumber, nails or corrugated fasteners, coarse curtain netting, string, carpet tacks or thumbtacks.

Work Job: Measure the oven's inside length and width. Make each tray frame with outside dimensions 1½ inches smaller than the oven's inside length and width. This amount of space is needed for air to circulate.

Tack strings diagonally between corners of each frame. Stretch the strings tight and twist where they cross. Stretch a single layer of netting on top of the strings, tightly across the frame, turn in a hem, and tack down on the underside of the frame.

Care of Trays: These trays can be cleaned without taking apart. Just wash the netting with a brush and warm soapy water. Rinse, then dry trays in oven or sun.

Blocks for Tray Stacking: Cut blocks 1¼ by 1¼ by 3 inches. Cut as many as you need. See section on Loading and Stacking.



Thermometer Needed

Without a thermometer it is almost impossible to control temperature in oven drying.

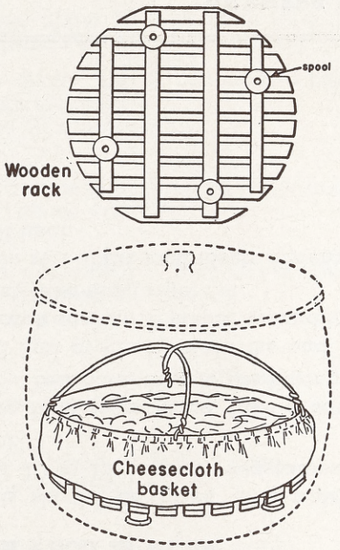
Any deep-fat, candy, dairy, or oven thermometer will do, provided it registers below 150° and up to 250° F. or higher.

Kettle and Kit

To precook vegetables and fruits, use a preserving kettle or any good-sized cooking vessel.

Steam the food if you can. A steamer can be made: Use a kettle with tight-fitting lid and a colander, strainer, deep-fat frying basket, or cheesecloth basket resting on a rack of wire or wood. An easy-to-make rack with spool legs is pictured.

To make a cheesecloth basket: Cut a cheesecloth circle about 10 inches larger in diameter than your kettle. Run through a small hem a wire not likely to rust. Make the wire rim the



right size to go into the kettle easily. Use wire or cord for handles. Then you can lift the handles with a fork.

Paring Knife

Pare with as sharp a knife as you have with a blade of stainless steel, glass, plastic, or silver—so foods won't be discolored.

If You Sulfur Outdoors

If you can sulfur light-colored fruits outdoors, get a box big enough to be turned upside down over trays and a dish beside them. Cut a flap near bottom of box for air to enter. This flap is closed after the sulfur has burned.

The sulfur—1 level teaspoon per pound of prepared fruit—is wrapped in paper and put in a discarded dish or pan beside trays. The paper is lighted and the box set snug against ground over trays and dish to prevent loss of sulfur fumes.

16—36319-1

HOW TO DRY FOOD IN AN ELECTRIC OR GAS OVEN

Have Food Ready

Choose for drying, fruits and vegetables that are fresh, ripe, sound—just right for table use. Decay on one slice of apple or mold on one bean may give bad flavor to a trayful.

Bring in from the garden or buy for drying only what you can dry at one time. Dry vegetables promptly to hold flavor and food value.

Wash food well. Get off every trace of dirt, spray, or any insecticide.

Pretreatment for Fruits

Apples and other light-colored fruits tend to darken in drying and storage.

Best known way to hold their color—and flavor and vitamins A and C—is to sulfur them.

Outdoors, use the sulfur box described. Or working indoors, soak fruit 15 minutes in a solution of 3½ tablespoons potassium metabisulfite or sodium sulfite to 1 gallon water. A druggist may order, if you can't buy either of these locally. Don't be concerned if sulfured food has a strong odor or taste when dried. The taste disappears during cooking.

Two less effective ways to treat light-colored fruits are: (1) Dip in a salt-water bath of 4 to 6 tablespoons salt to 1 gallon water for about 10 minutes. (2) Precook fruits, except apples, in steam or boiling water until tender but firm.

Pretreatment for Vegetables

See Drying Table for special treatment for certain foods.

For precooking vegetables, best choice is to steam over a little boiling water. If you can't steam for lack of a kettle with a lid, cook in enough boiling water to cover. See Drying Table for steaming time. Boiling takes less time than steaming, but cook until tender but firm is the general rule.

Oven Ready on Time

When food is ready, have the oven ready, too. Set one oven rack about 3 inches from the oven floor and the other rack, if there are two, just far enough above for two trays to be stacked between.

Don't turn on the top unit in an electric oven. If necessary, remove it.

Turn on the current or light the gas burner 15 minutes before drying time. If there's a regulator, set it at 150°, 200°, or 250° F., whichever is lowest setting on your oven. If a gas stove has no regulator, turn the flame very low. Be careful throughout drying lest the flame go out unnoticed.

If it's an electric oven, keep the door closed while it warms. If it's a gas oven, prop the door open at the top corner with an 8-inch stick.

Loading and Stacking

Spread food evenly, 1 to 2 pounds to each tray. The lighter load dries faster. If a gas-oven floor has corners cut out, don't spread food on tray corners—it will scorch.

If you dry different foods at one time, don't include onions, celery, kale, or other foods with strong flavor or odor.

Stack two loaded trays together, using a wood block at each corner, so air can circulate between trays. Place one stack on each oven rack; or, if there is only one rack, use extra blocks and stack three or four trays together.

Number trays "1" to "4" and mark front and back to help keep track of tray positions.

Not Too Hot

Put the thermometer on the top tray. Temperature should stay about 150° F. Prop an electric oven door open by tucking a folded pot holder in top corner to make about a half-inch crack. Prop a gas oven door open 8 inches at top. The right opening helps control heat and lets out moist air.

If you can't keep oven heat down to 150° F., prop the door a little wider; or in a gas range, reduce flame by turning oven-valve handle toward "off" position. As you turn it, watch lest the flame go out.

Be a Clock Watcher

Temperature and air flow are not the same everywhere in an oven. Trays nearest oven ceiling and floor dry fastest. So—

About every half hour take each stack out. If food is more than one layer deep on a tray, stir or turn pieces so they can dry evenly. Returning stacks to oven, change places of top and bottom stack and turn back to front.

Every hour or two reverse trays in each stack, making upper tray serve as lower.

If oven has only one rack, treat four trays as two stacks when you shift and turn. If there are three trays, shift bottom tray to top, top to middle, middle to bottom.

Most vegetables take 4 to 12 hours to dry; fruits, 6 hours or longer.

When Food Is Done

Fruits should be dried to a moisture content of 10 to 15 percent; vegetables, 5 to 10 percent.

When food seems done, take a sample out; cool it. Test according to the Drying Table.

Food that overheats near the end of drying will scorch easily. If pieces around tray edges dry first, take them right out.

When rest of the food meets dry-enough test, turn off heat.

DRYING TABLE FOR FRUITS AND VEGETABLES

1. Spread in single layers on trays unless otherwise noted.
2. Usual drying temperature is 150° F. Onions or cabbage require temperature not above 135°. Open oven door wider if temperature cannot be otherwise controlled.

FOOD	PREPARATION FOR DRYING	DRYNESS TEST
FRUITS		
Apples	Pare, core, and cut in one-fourth inch slices or rings. Sulfur outdoors 30 minutes, or dip in solution. Spread not more than one-half inch deep on trays—overlap rings.	Pliable, springy feel, creamy white.
Apricots	Same as peaches	Pliable and leathery.
Berries	No pretreatment. Leave whole, except cut strawberries in half.	No visible moisture when crushed.
Cherries	Remove stems and pits. If juicy, drain about 1 hour	Leathery but sticky.
Figs	Steam or dip in boiling water for 1 minute. Peel if desired; cut large figs in half.	Glossy skin, slightly sticky.
Grapes	Leave whole, remove stems. Dip in boiling water to crack skins.	Pliable, dark brown.
Nectarines	Same as peaches	Pliable and leathery.
Peaches	Peel if desired. Cut in halves, remove pits. Sulfur outdoors, peeled 30 minutes, unpeeled 2 to 3 hours; or dip in solution; or precook. Dry pit side up.	Pliable and leathery.
Pears	Pare and remove core and woody tissue. Cut into one-fourth inch slices or rings, or into quarters or eighths. Sulfur outdoors 2 to 4 hours, according to size of pieces; or dip in solution; or precook.	Leathery, springy feel.
Plums	Same as prunes. Use freestone kinds. Sulfuring 20 to 25 minutes helps them to keep better.	Pliable and leathery.
Prunes	Cut in halves and remove pits or leave whole. Halves: No pretreatment. Whole: To soften and crack skins and to help fruit dry better, hold in steam or boiling water for 2 minutes, or dip in a boiling lye bath (3 tablespoons lye to 1 gallon water) for one-half minute.	Pliable and leathery.
VEGETABLES		
Asparagus	Use 3-inch tips only, split lengthwise after cooking. Steam 10 minutes, or until tender but firm.	Very brittle, greenish black.
Beans, green lima	Shell. Steam 15 to 20 minutes, or until tender but firm	Shatter when hit with a hammer.
Beans, snap	Trim and slice lengthwise or cut in 1-inch pieces. Steam about 20 minutes, or until tender but firm. Spread about one-half inch deep on trays.	Brittle, dark green to brownish.
Beets	Trim off all but 1 inch of tops and roots. Steam whole about 30 to 60 minutes depending on size, or until cooked through. Cool and peel. Cut in one-fourth inch cubes, or slice one-eighth inch thick. Spread not more than one-fourth inch deep on trays.	Brittle, dark red.
Broccoli	Trim, slice lengthwise in one-half inch strips. Steam 10 minutes or until tender but firm.	Brittle, very dark green.
Brussels sprouts	Cut lengthwise, one-half inch thick. Steam until tender, 12 minutes.	Crisp.
Cabbage	Trim, cut in strips one-fourth inch thick. Steam 5 to 10 minutes, or until tender but firm. Spread evenly to a depth of not more than 1 inch. (See note 2 at head of table.)	Crisp, pale yellow to green.
VEGETABLES—Continued		
Carrots	Steam whole about 20 minutes, or until tender but firm. Scrape or peel. Slice crosswise one-eighth inch thick, or dice in one-fourth inch cubes. Or shred before steaming. Spread not more than one-half inch deep on trays.	Very brittle, deep orange
Cauliflower	Separate into flowerlets, cut large ones in half. Dip in salt solution (6 tablespoons salt per gallon of water). Steam 10 minutes, or until tender but firm.	Hard to crisp, tannish yellow.
Celery	Strip off leaves, cut stalks into one-half inch pieces. Steam 10 minutes or until tender. Stir occasionally during drying.	Very brittle.
Corn	Husk, trim. Steam on cob until the milk is set, about 15 minutes. Cut from the cob. Spread one-half inch deep.	Shatters when hit with a hammer.
Eggplant	Peel and slice one-eighth to one-fourth inch thick. Dip immediately in a solution of 6 tablespoons vinegar to 1 gallon water for 25 minutes. Steam at once for 5 to 10 minutes or until tender when tested with a fork.	Leathery to brittle.
Greens	Trim off tough stems. Steam 5 to 20 minutes or until tender. Spread leaves that mat, such as spinach, about one-fourth inch deep; others, not more than 1 inch.	Crisp, very dark green.
Mushrooms	Peel the larger mushrooms. Dry whole or sliced, depending on size. No precooking necessary. If stems are tender, slice for drying; if tough, discard. Spread not more than one-half inch deep on trays.	Leathery to brittle
Okra	Use young, tender pods only. Cut one-half inch, crosswise slices or split lengthwise. Steam 5 to 8 minutes. Spread not more than one-half inch deep on trays.	Very brittle.
Onions	Peel, slice into one-eighth inch rings. Steam 5 to 10 minutes. If dried for seasoning, do not steam. (See note 2 at head of table.)	Very crisp.
Parsnips	Same as carrots	Very brittle.
Peas, green	Steam shelled peas 15 minutes, until tender but firm. Stir frequently during the first few hours of drying.	Shatter when hit with a hammer.
Peppers and pimientos.	Cut in one-half inch strips or rings. Remove seeds. Steam 10 minutes. Spread rings 2 layers deep—strips not more than one-half inch deep.	Pliable.
Pumpkin	Quarter, remove seeds and pith, cut in 1-inch strips, and peel. Slice strips crosswise one-fourth inch thick. Steam 8 to 13 minutes, until slightly soft but not sticky.	Leathery.
Rhubarb	Cut in 1-inch lengths. Dip in actively boiling water 3 minutes.	Very brittle, dark green and red.
Rutabagas	Quarter, peel, cut in one-eighth inch slices or strips. Steam 15 minutes, or until tender but firm.	Leathery.
Soybeans, edible green.	Blanch pods in steam 10 to 15 minutes, or until beans are tender but firm. Shell.	Shatter when hit with a hammer.
Squash, Hubbard	Same as pumpkin	Leathery.
Squash, summer and Zucchini.	Trim, slice one-fourth inch thick without peeling, steam 6 to 8 minutes, or until just tender.	Leathery to brittle, yellow.
Tomatoes (meaty varieties only).	Dip in boiling water for 1 minute. Peel, remove stem end, slice one-eighth inch thick.	Leathery, dull red.
Turnips	Same as rutabagas	Leathery.

16—36319-1

Package Your Product

Cool the food, then package at once. Foods that seem "bone dry" may be spoiled by dampness in storage. Insect saboteurs can enter tiny cracks in a seal or seaming.

Fill containers as tightly as possible without crushing the food. This forces air out. Then seal tightly to keep air out.

Glass jars, the sort used in home canning, are especially good for dried foods. If old jar rings are used, use two for a tight seal. Or pack food in old coffee cans or other tins with a tight lid. You can use Scotch tape or adhesive tape, or cloth dipped in paraffin around a lid to help make a seal.

Another possibility: Use heavily waxed paper cartons with tight-fitting lids or get bags especially made for storing dried foods. These are moisture and vapor proof and can be sealed with a warm iron. Paper is not so safe from insects and mice, so store small packages in a crock, lard can, or tin with good lid.

Properly dried and stored, most vegetables keep well about 6 months. Tomatoes and mushrooms are exceptions; use within about 3 months. Fruits well dried keep a year or longer.

It pays to package vegetables in fairly small quantities. You can use small packets handily. Roughly, 1 to 2 cups of dried food serve 6—leafy vegetables take 4 to 6 cups . . . you can pack accordingly. Also, dried food is best soon after opening. And you don't expose the lot to air and possible dampness when you take out a little.

Keep Dry, Cool, Dark

Store in a dry, cool place, to hold food value and flavor.

Dark storage helps dried food keep its color and flavor. If necessary, make a blackout for glass jars.

Examine dried food in storage occasionally. If you find signs of moisture, heat the food again to 150° F. for 15 minutes and repackage.

For Good Eating

1. Soak dried foods in just enough cold water to cover, and just until food is plump. Few foods need more than 2 hours, some less. Dried greens, finely cut vegetables, thinly sliced fruits don't require soaking at all.

2. Use same water for cooking as for soaking.

3. Boil gently in covered pan, just until tender. Cooking time varies with the food and may be 10 to 30 minutes.

4. Sweeten fruits. Season vegetables with fat, meat, garlic, onion, or use in soups, stews, or baked dishes. You can add salt to vegetables any time—during soaking, while cooking, or before serving.

Oven-Drying Arithmetic

The tabulation below gives some idea of the yield of dried food that can be obtained from a peck of a fruit or vegetable, as bought or picked. Weights per peck given below are approximate.

Apples	12 lb. yield 1¼ lb. (3 pt.)
Beans, lima	7 lb. yield 1¼ lb. (2 pt.)
Beans, snap	6 lb. yield ½ lb. (2½ pt., 1-inch pieces)
Beets	15 lb. yield 1½ lb. (3–5 pt.)
Broccoli	12 lb. yield 1¼–1½ lb. (12–15 pt.)
Carrots	15 lb. yield 1¼ lb. (2–4 pt.)
Celery	12 lb. yield ¾ lb. (3½–4 pt.)
Corn	18 lb. yield 2½ lb. (4–4½ pt.)
Greens	3 lb. yield ¼ lb. (5½ pt.)
Onions	12 lb. yield 1½ lb. (11½ pt., sliced; 4½ pt., shredded)
Peaches	12 lb. yield 1–1½ lb. (2–3 pt.)
Pears	14 lb. yield 1½ lb. (3 pt., quarters)
Peas	8 lb. yield ¾ lb. (1 pt.)
Pumpkin	11 lb. yield ¾ lb. (3½ pt.)
Squash	10 lb. yield ¾ lb. (5 pt.)
Tomatoes	14 lb. yield ½ lb. (2½–3 pt.)

References

Other publications on methods of food preservation available from the United States Department of Agriculture are:

Wartime Canning of Fruits, Vegetables. 41-AWI.

Canning Tomatoes. 61-AWI.

Preservation of Vegetables by Salting or Brining. 1932-F.

Home Storage of Vegetables and Fruits. 1939-F.

Issued by

BUREAU OF HUMAN NUTRITION
AND HOME ECONOMICS
Agricultural Research Administration
U. S. Department of Agriculture
Washington, D. C.
August 1943

U. S. GOVERNMENT PRINTING OFFICE 16—36319-1

OVEN DRYING

One way to save Victory Garden Surplus

U. S. DEPARTMENT OF AGRICULTURE
AWI-59

References

Other publications on methods of food preservation available from the United States Department of Agriculture are:

Wartime Canning of Fruits, Vegetables. 41-AWI.

Canning Tomatoes. 61-AWI.

Preservation of Vegetables by Salting or Brining. 1932-F.

Home Storage of Vegetables and Fruits. 1939-F.

Issued by

BUREAU OF HUMAN NUTRITION
AND HOME ECONOMICS
Agricultural Research Administration
U. S. Department of Agriculture
Washington, D. C.
August 1943

U. S. GOVERNMENT PRINTING OFFICE 16—36319-1